

# NASA Health and Air Quality

remote sensing for public health

volume 4, september 2016

**NASA Applied Sciences' DEVELOP Program held its Applications Showcase at NASA Headquarters in Washington, DC, on August 10, 2016.**



*Photos by Carrie Kelley, Bill Ingalls, and Shobhana Gupta*

DEVELOP summer projects included four in the Health and Air Quality fields.

**Maya Midzik, Joseph Abbate, and Garima Raheja** partnered with the **Bay Area Quality Management District** and **NASA Alpha Jet Atmospheric eXperiment** to use satellite, aircraft and ground-based observations to monitor methane and improve a greenhouse gas inventory network for the San Francisco Bay area.

**Jason Hodgson, Leslie Araujo, and Tamara Dunbarr** partnered with the **Maricopa County Department of Health** and **Maricopa County Air Quality Department** to monitor PM10 concentrations for enhanced decision making and epidemiology.

**Amy Wolfe, Amber Showers, Emily Beyer, Eric White, and Tyler Rhodes** partnered with the **National Park Service (NPS)** to monitor ozone and atmospheric pollutants in the troposphere to help regulate point source emissions along the Appalachian Trail, and to improve ozone advisory messages by the NPS.

**Christie Stevens, Toni Strauch, and Alec Courtright** partnered with the **CDC**, the **EPA** and the **AirNow Program** to understand the temporal and spatial variation of air quality to support the use of satellite aerosol data for the coastal United States.

## upcoming:

### Recently Aired ARSET Webinars:

**Intro to Satellite Remote Sensing for Air Quality Applications**  
**Fundamentals of Satellite Remote Sensing for Health Monitoring**

### Meetings:

**American Public Health Association Annual Meeting**  
**October 29-November 2, 2016**  
**Denver, CO**

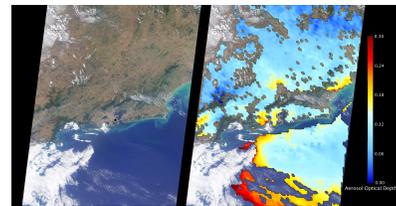
**HAQAST Meeting**  
**November 2-4, 2016**  
**Atlanta, GA**

**American Society of Tropical Medicine and Hygiene Meeting**  
**November 13-17, 2016**  
**Atlanta, GA**

**American Geophysical Union Fall Meeting**  
**December 12-16, 2016**  
**San Francisco, CA**

## Our Research in the News

- Record-shattering temperatures set July 2016 to be hottest month on record. **Mashable.**
- Elevated levels of air pollution were recorded in Rio de Janeiro during the Olympics. **Popular Science.**



*Photo from www.nasa.gov*

- Natural gas leaks identified as major contributors to methane hot spots in Southwestern United States. **ABC News.**

## HEALTH AND AIR QUALITY APPLICATIONS

### APPLIED SCIENCES PROGRAM

**JOHN HAYNES**

PROGRAM MANAGER  
HEADQUARTERS

**SUE ESTES**

ASSOCIATE  
MARSHALL SPACE  
FLIGHT CENTER

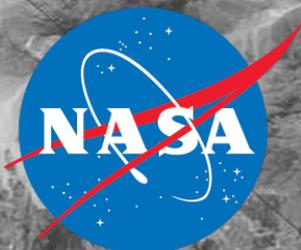
**ALI OMAR**

ASSOCIATE  
NASA-LANGLEY  
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**SHOBHANA GUPTA**

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SPOTLIGHT

## DEVELOP

Shaping the future by integrating Earth observations into global decision making.

NASA's DEVELOP Program connects a diverse group of end-users directly to NASA's data and products for societal benefit across the globe.

Over 400 participants are selected annually from an accomplished pool of currently enrolled college students, recent graduates, early career professionals, transitioning career professionals, and active and recently transitioned U.S. military service members.

These participants partner with local and state governments, regional consortiums, federal agencies, non-governmental and private organizations, academic institutions, and international governments to implement rapid, reliable, and responsive applications of Earth observations

for data-driven decision making, often saving organizations time and costs.

DEVELOP conducts projects in the spring, summer, and fall, on a 10-week timeline, fostering rapid applied benefit. This summer, 138 participants partnered with 72 local and state governments, regional consortiums, federal agencies, non-governmental and private organizations, academic institutions, and international governments to provide applications of Earth observations to end users.

To participate in this dynamic program as participants, project partners, or advisors, please contact the DEVELOP team [here](#).

Upcoming Deadlines:

**Aug 29-Oct 7** Application Window for Spring 2017 Term

**Jan 9-Feb 17** Application Window for Summer 2017 Term

## WHAT'S NEW IN THE FIELD?

### QUANTIFYING THE IMPACT OF SCENIC ENVIRONMENTS ON HEALTH

*Nature Scientific Reports*  
November 25, 2015

Seresinhe et. al. compared crowdsourced ratings of environmental aesthetics to self-reported health data, and find that inhabitants of more scenic environments report better health across urban, suburban, and rural areas. Even when accounting for air pollutants, inhabiting regions with large areas of water, open blue skies or mountainous landscapes has a significant impact on health.

### EARLY LIFE EXPOSURE TO THE GREAT SMOG OF 1952 AND THE DEVELOPMENT OF ASTHMA

*American Journal of Respiratory and Critical Care Medicine*  
July 8, 2016

Bharadwaj et. al. describe their findings of increased risk of asthma development following early-life exposure, as observed following the Great Smog of London in 1952.

### FEATURED

### NEW GENERATION OF SATELLITES WILL SHED LIGHT ON RESPIRATORY DISEASE

*Lancet Respiratory Medicine*  
September, 2016

Bryant Furlow's spotlight featured HAQ's John Haynes, who described NASA's new generation of public health-oriented satellite missions, like the Multi-Angle Imager for Aerosols (MAIA) and Tropospheric Emissions: Monitoring Pollution (TEMPO) spectrometer satellite instruments.

### CHALLENGES OPEN FOR PARTICIPATION!

For more information, check out [www.challenge.gov](http://www.challenge.gov)



NASA's Cube Quest Challenge  
Open until  
December 31, 2018

EPA's Smart City Air Challenge  
Open until  
October 28, 2016



**Challenges by our Founding Fathers**

[Read about then Secretary of State, and future President, Thomas Jefferson's challenge idea to design a capitol building for a new nation! Winner to receive \\$500 and a piece of land in the District of Columbia!](#)

### Here are some of the recent Challenges in health and air quality areas that have generated phenomenal results!

#### DARPA's Forecasting Chikungunya Challenge

Winners and University of Arizona Professors Jocelyn Lega, Epidemiology, and Heidi Brown, Mathematics, developed a mathematical model to forecast infection growth rate as the disease emerges in new countries.

#### NIEHS's My Air, My Health Challenge

Winners David Kuller, Gabrielle Savage, and Dot Kelly designed the Conscious Clothing system, a wearable breathing analysis tool that calculates the amount of particulate matter a person inhales, measures breath volume, and transmits data in real time via Bluetooth.